

REMARKS

Summary of Office Action

As an initial matter, Applicants note with appreciation that the Examiner has withdrawn the rejection of claims 53 and 63 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Mennig et al., U.S. Patent No. 6,455,103 (hereafter "MENNIG"), in view of Edwards, U.S. Patent No. 3,493,289 (hereafter "EDWARDS") and further in view of Arney et al., U.S. Patent No. 6,493,289.

Claims 51-63, 66-68, 70, 71 and 81-92 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for allegedly failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention.

Claims 51, 52, 55-60, 66-68, 70, 71, 81, 82 and 87 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over MENNIG in view of EDWARDS.

Claims 54 and 90 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over MENNIG in view of EDWARDS and further in view of Landau, U.S. Patent No. 4,188,444 (hereafter "LANDAU").

Claims 62, 88 and 92 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over MENNIG in view of EDWARDS and further in view of Zimmermann et al., US 2002/0017452 (hereafter "ZIMMERMANN").

Claims 61, 88 and 91 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over MENNIG in view of EDWARDS and further in view of Forrest et al., U.S. Patent No. 6,091,195 (hereafter "FORREST").

Claims 52, 85, 86 and 88 are rejected under 35 U.S.C. § 103(a) as allegedly being

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unpatentable over MENNIG in view of EDWARDS and further in view of Albares et al., U.S. Patent No. 4,696,536 (hereafter “ALBARES”).

Claims 52, 53, 60, 63, 83, 84 and 89 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over MENNIG in view of EDWARDS and further in view of Kaspaal et al., U.S. Patent No. 3,698,946 (hereafter “KASPAUL”).

Response to Office Action

Reconsideration and withdrawal of the rejections of record are respectfully requested, in view of the following remarks.

Response to Rejection under 35 U.S.C. § 112, Second Paragraph

Claims 51-63, 66-68, 70, 71 and 81-92 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for allegedly failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. The rejection alleges that it is not clear what the recitation “obtainable by” in claim 51 means.

Applicants respectfully traverse this rejection. In particular it is not seen that one of ordinary skill in the art would not understand what “obtainable by” in connection with a recited process means. In fact, there are probably hundreds, if not thousands of U.S. patents whose claims contain the same recitation. In view thereof, it is submitted that the instant rejection is unwarranted and should be withdrawn, which action is respectfully requested.

Response to Rejection under 35 U.S.C. § 103(a) over MENNIG in view of EDWARDS

Claims 51, 52, 55-60, 66-68, 70, 71, 81, 82 and 87 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over MENNIG in view of EDWARDS. The Examiner essentially repeats the assertions set forth in the previous Office Action and again essentially alleges that MENNIG discloses or renders obvious the elements of the claimed substrate with the exception that MENNIG fails to disclose a crystalline transparent substrate, such as quartz. In this regard, the Examiner takes the position that EDWARDS cures the noted deficiencies of MENNIG.

Applicants respectfully traverse this rejection for all of the reasons which are set forth in the response to the previous Office Actions. The corresponding remarks are expressly incorporated herein.

It is pointed out again that the process of MENNIG includes a one-step thermal densification of the multilayer system and removal of the organic constituents present by baking (see, e.g., col. 2, lines 1-3 of MENNIG). Further, according to col. 7, lines 55-61 of MENNIG, this baking step is carried out at high temperatures, i.e., at least 400° C. According to Examples 5 to 7 of MENNIG a temperature of 450° C was employed for 10 minutes.

While it is apparent that glass (employed as the only substrate material in MENNIG) will withstand such drastic conditions, it is by no means clear that any other materials which may otherwise be considered to be suitable as substrate materials for optical systems are able to withstand the baking conditions taught by MENNIG.

Applicants note that in this regard, the Examiner relies on the melting point of quartz. However, even if quartz would not melt under the conditions described by MENNIG, this does

not mean that quartz would not be affected at all by these drastic conditions. It is pointed out that the Examiner has not provided any document which describes the treatment of a quartz substrate under conditions which are comparable to those described by MENNIG.

It still is not seen that the additional documents relied upon by the Examiner in the instant Office Action teach or suggest that the materials mentioned therein (with the exception of glass) would also be suitable for the process of MENNIG.

In particular, the process of EDWARDS merely involves a thermal deposition of a material such as manganese sulfide onto a substrate material. To be suitable for this process, the substrate material clearly does not have to be particularly heat-resistant. This is evidenced, for example, by the fact that in addition to glass (i.e., the only substrate material used in the Examples of EDWARDS) and quartz, also plastic materials such as polyvinylbutyral are suitable as substrate materials for the process of EDWARDS (see, e.g., col. 4, lines 54-57).

Further, according to col. 3, lines 32-36 of EDWARDS, the thermal deposition process described therein is conducted at a pressure of not more than 25 micron ($= 3.3 \times 10^{-2}$ mbar). In such a process the substance deposited onto the substrate grows on the surface of the substrate, leading to a good adhesion to the substrate. Even if the substrate materials mentioned in EDWARDS can be considered to be equivalent for the process described therein, it is not seen that one of ordinary skill in the art would conclude that these substrates are also equivalent for all other (coating) processes, including the completely different process described in MENNIG. There can be no reasonable doubt in Applicants' opinion that the processes of EDWARDS and MENNIG have nothing in common. For example, EDWARDS does not teach or suggest a thermal densification (baking), let alone after the deposition of multiple layers. There are also

other documents relied upon by the Examiner which describe a sputtering process rather than the application of a free-flowing composition (see, e.g., ZIMMERMANN).

Applicants submit that there is no apparent reason for one of ordinary skill in the art to replace the glass in the process of MENNIG by a material such as quartz merely because glass and quartz are mentioned as equivalent in a document i.e., EDWARDS, that describes a process which is not comparable at all with the process of MENNIG. In other words, the Examiner appears to apply hindsight in this regard. “We must still be careful not to allow hindsight reconstruction of references to reach the claimed invention without any explanation as to how or why the references would be combined to produce the claimed invention.” *Innogenetics, N.V. v. Abbott Labs.*, 512, F.3d 1363, 1374 n.3 (Fed. Cir. 2008).

Applicants submit that in view of the foregoing, the instant rejection under 35 U.S.C. § 103(a) over MENNIG in view of EDWARDS is without merit, wherefore withdrawal thereof is warranted as well.

Response to Rejection under 35 U.S.C. § 103(a) over MENNIG in view of EDWARDS and LANDAU

Claim 54 and 90 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over MENNIG in view of EDWARDS and further in view of LANDAU. The rejection concedes that MENNIG and EDWARDS both fail to teach a crystalline substrate comprising PbS or selenium, but alleges that LANDAU teaches that glass can contain selenium, thereby allegedly rendering it obvious to modify the glass substrate of MENNIG to include selenium “in order to provide a transparent crystalline glass substrate for an optical system.” In this regard the Examiner further alleges that “the glass substrate of Mennig is deemed to be a crystalline

substrate when modified to contain small quantities of selenium as suggested by Landau, since the glass is containing selenium, even if it is small quantities of selenium.

This rejection is respectfully traversed as well. In particular, the only substrate material mentioned in LANDAU is glass (see, e.g., title and abstract of LANDAU). While it is correct that LANDAU mentions in col. 2, lines 63-64 that the glass may contain small quantities of selenium, the glass is still a glass, i.e., not a crystalline substrate.

Applicants point out that a glass is never crystalline, and neither has the Examiner provided any evidence to the contrary. At any rate, it is not seen why the incorporation of a small quantity of selenium would transform a glass into a crystalline material (although not a “crystalline glass”, which is an oxymoron).

In view of the foregoing, Applicants submit again that even if the glass of LANDAU were assumed to contain small quantities of selenium it would not be a crystalline substrate. For this reason alone, MENNIG in view of EDWARDS and LANDAU is unable to render obvious the subject matter of instant claims 54 and 90, thereby clearly warranting withdrawal of the instant rejection.

Response to Rejection under 35 U.S.C. § 103(a) over MENNIG in view of EDWARDS and ZIMMERMANN

Claims 62, 88 and 92 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over MENNIG in view of EDWARDS and further in view of ZIMMERMANN. The rejection concedes that MENNIG and EDWARDS both fail to teach a crystalline substrate comprising a watchglass of sapphire but essentially alleges that this deficiency is cured by

ZIMMERMANN.

Applicants respectfully traverse this rejection as well. While ZIMMERMANN mentions sapphire glass as an example of a substrate that can be provided with an antireflection coating, the situation is similar to that set forth above with respect to the rejection over MENNIG in view of EDWARDS. In particular, there is no indication whatsoever in ZIMMERMANN that sapphire glass would be able to withstand the drastic heat treatment (baking) conditions described for the last step of the process of MENNIG. Applicants note that in this regard the Examiner relies upon the melting point of sapphire. However, even if sapphire would not melt under the conditions described by MENNIG, this does not mean that sapphire would not be affected at all by these drastic conditions. The Examiner has not provided any document which describes the treatment of a sapphire substrate under conditions which are comparable to those described by MENNIG.

In this regard, it is pointed out again that according to, e.g., paragraph [0010] of ZIMMERMANN, the coating on the substrate is essentially produced by sputtering. It is still not seen that ZIMMERMANN teaches or suggests to one of ordinary skill in the art that the sapphire substrate mentioned therein can and should replace the regular glass substrate used in a completely different process, i.e., the process described by MENNIG.

In view of the foregoing, the instant rejection under 35 U.S.C. § 103(a) over MENNIG in view of EDWARDS and ZIMMERMANN also is without merit and should be withdrawn, which action is respectfully requested.

Response to Rejection under 35 U.S.C. § 103(a) over MENNIG in view of EDWARDS and FORREST

Claims 61, 88 and 91 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over MENNIG in view of EDWARDS and further in view of FORREST. The rejection concedes that MENNIG and EDWARDS both fail to teach a crystalline substrate comprising a sheet of sapphire but essentially alleges that this deficiency is cured by FORREST.

Applicants respectfully traverse this rejection as well. While FORREST mentions sapphire in addition to glass, quartz, and plastic as examples of transparent substrates that can be provided with pixels, the situation is similar to that set forth above with respect to the rejections over MENNIG in view of EDWARDS and over MENNIG in view of EDWARDS and ZIMMERMANN. In particular, there is no indication whatsoever in FORREST that the material for the substrate mentioned therein should be able to withstand the drastic heat treatment (baking) conditions described for the last step of the process of MENNIG. Neither does FORREST suggest that there would be any advantage in replacing the glass substrate in the process of MENNIG by a sapphire substrate.

Applicants submit that for at least the foregoing reasons, the instant rejection under 35 U.S.C. § 103(a) over MENNIG in view of EDWARDS and FORREST is without merit as well, wherefore withdrawal thereof is warranted and respectfully requested.

Response to Rejection under 35 U.S.C. § 103(a) over MENNIG in view of EDWARDS and ALBARES

Claims 52, 85, 86 and 88 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over MENNIG in view of EDWARDS and further in view of ALBARES. The

rejection concedes that MENNIG and EDWARDS both fail to teach a crystalline substrate comprising lithium niobate or lithium tantalate but essentially alleges that this deficiency is cured by ALBARES.

Applicants respectfully traverse this rejection as well. In particular, even if ALBARES mentions glass, lithium niobate and lithium tantalate as examples of a transparent substrate in an optical device this clearly does not mean that these substrates are interchangeable for all purposes and that lithium niobate and lithium tantalate can be subjected to all processes and conditions to which glass can be subjected. In this regard, it is to be taken into account that the processes of MENNIG and ALBARES have virtually nothing in common. Further, the Examiner has not provided any evidence that lithium niobate and lithium tantalate would be able to withstand the high-temperature conditions of MENNIG.

Applicants submit that for at least all of the foregoing reasons, the Examiner has failed to establish a *prima facie* case of obviousness of the subject matter of instant claims 52, 85, 86 and 88 over MENNIG, EDWARDS and ALBARES.

Response to Rejection under 35 U.S.C. § 103(a) over MENNIG in view of EDWARDS and KASPAUL

Claims 52, 53, 60, 63, 83, 84 and 89 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over MENNIG in view of EDWARDS and further in view of KASPAUL.

The rejection concedes that MENNIG and EDWARDS both fail to teach a crystalline substrate comprising PbS but essentially alleges that this deficiency is cured by KASPAUL. The rejection also concedes that MENNIG and EDWARDS both fail to teach a substrate being a

wafer, but alleges this is merely a design choice.

Applicants respectfully traverse this rejection as well. In particular, even if KASPAUL mentions that any convenient transparent substrate, such as glass, quartz, ceramic, silicon, germanium, gallium arsenide, lead sulfide, indium antimonide, cadmium sulfide, cadmium selenide, zinc sulfide, and/or other semiconductor materials used in solid-state photodetectors, light-emitting devices, image converters, image amplifiers and similar electro-optical devices, or a flexible polymer material can be used for providing a transparent electrically-conductive coating thereon, which coating is a composite layer comprising a first layer deposited as titanium dioxide, a second layer of noble metal and a third layer deposited as titanium dioxide, this apparently does not teach or suggest that all of these materials can or should be used in the (high-temperature) process of MENNIG merely because MENNIG uses glass as a transparent substrate. Further, the Examiner has not provided any evidence which would make it reasonable to assume that a crystalline substrate comprising PbS would be able to withstand the conditions of the process of MENNIG.

Regarding the use of a wafer in the process of MENNIG, it is not seen that MENNIG or any of the other documents relied upon by the Examiner teaches or suggests a corresponding substrate. In this regard, it is pointed out that “rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006).

Applicants submit that for at least all of the foregoing reasons, the Examiner has failed to establish a *prima facie* case of obviousness of the subject matter of instant claims 52, 53, 60, 63,

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83, 84 and 89 over MENNIG, EDWARDS and KASPAUL as well.

CONCLUSION

In view of the foregoing, it is believed that all of the claims in this application are in condition for allowance, wherefore an early issuance of the Notices of Allowance and Allowability is again respectfully solicited. If any issues yet remain which can be resolved by a telephone conference, the Examiner is respectfully invited to contact the undersigned at the telephone number below.

Respectfully submitted,
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/Heribert F. Muensterer/

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